25X1

[redacted]

8 November 1965

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25X1

Subject: [redacted] Project [redacted]
Progress Report - October 1965

25X1

Gentlemen,

Enclosed is a copy of [redacted] Progress Report on Project [redacted] for the period covered 1-31 October 1965. Also included is our Financial Report on the above program.

25X1

Very truly yours,

[redacted]

25X1

LHB/de

Enc: (1) P.R.
(1) F.R.

[redacted]

25X1

Approved For Release 2002/08/20 : CIA-RDP78B04747A003000050039-2

[redacted]

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25X1 [redacted]

8 November 1965

25X1 Subject: [redacted] Project [redacted] 25X1
Progress Report - October 1965

Gentlemen,

Enclosed is a copy of [redacted] Progress 25X1
25X1 Report on Project [redacted] for the period covered 1-31 October 1965. Also included is our Financial Report on the above program.

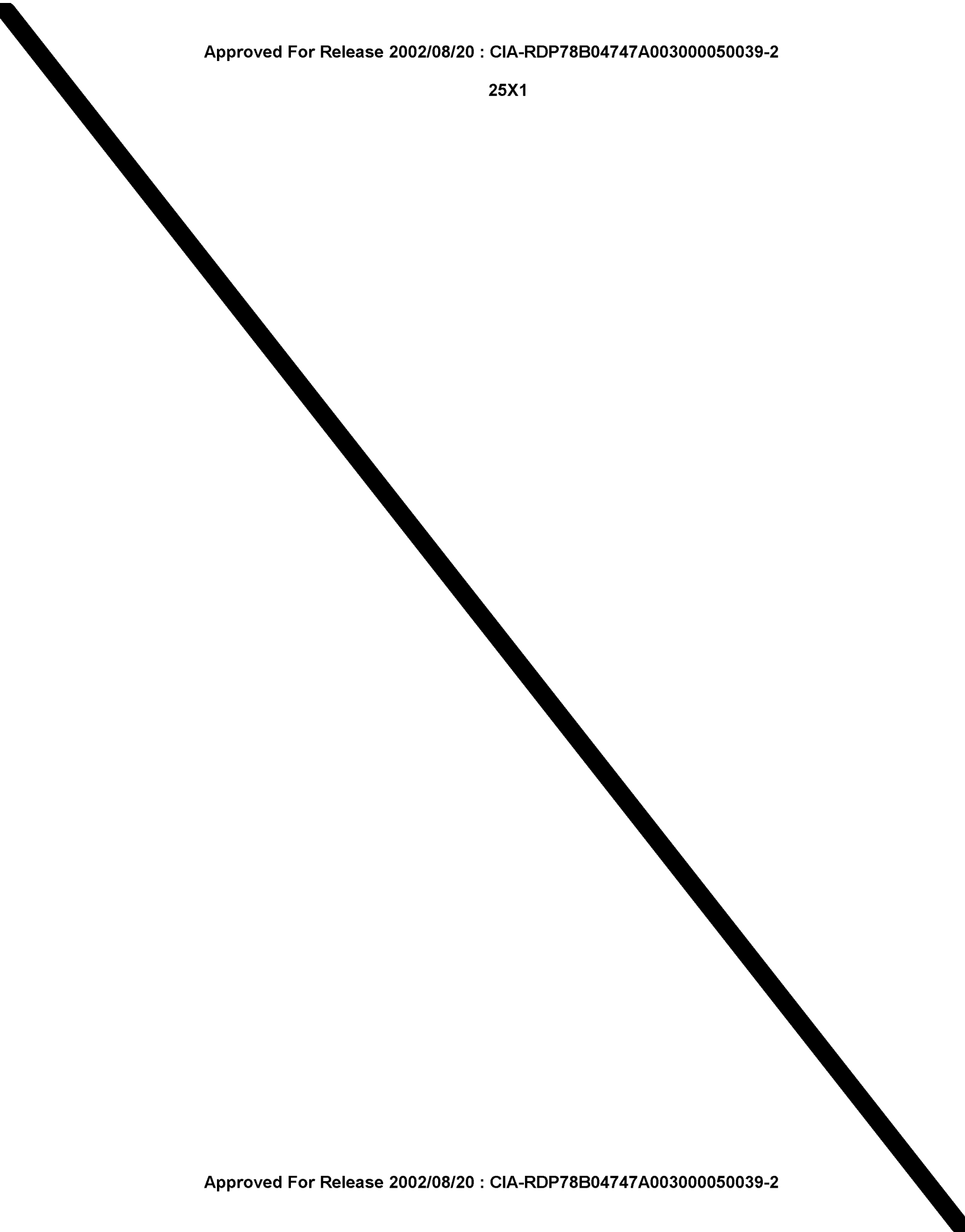
Very truly yours,

[redacted] 25X1

LHB/de

Enc: (1) P.R.
(1) F.R.

25X1 [redacted]



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25X1 [redacted] PROGRESS REPORT

Period Covered: 1-31 October 1965

25X1 Document No.: [redacted]

Dated: 5 November 1965

PRESENT STATUS

25X1 [redacted]

25X1 A full effort has been initiated on the redesign [redacted] to incorporate power assist for film transport. A number of systems and techniques have been investigated, and a few circuits breadboarded. A considerable effort has been made to keep the instrument height to a minimum. The most promising configuration consists of using a small universally wound motor coupled to the film drive through an electro mechanical clutch. The motor supplies torque to assist in transporting the film according to the torque being supplied by the operator at the handwheel. Control of motor torque is achieved in the handwheel assembly; the handwheel is coupled to the load through a spring centered potentiometer - as the operator starts to rotate the handwheel he causes the potentiometer card (attached to the handwheel) to rotate with respect to the wiper (attached to the film drive). This produces a signal which controls motor speed (through a solid state servo amplifier) to keep the film driving shaft in synchronism with the handwheel. Since the potentiometer assembly rotates with the handwheel, slip rings are used to supply excitation and pick-off potentiometer voltage.

The motor servo amplifier is a simple but sophisticated silicon controlled rectifier type. Motor speed is made proportional to error signal input using the residual induced voltage in the motor armature as a velocity feedback signal. This is

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possible since the SCR circuit can fire only during one half of the cycle, during the other half of the cycle the residual induced voltage is used to establish the firing point for the next cycle. With the motor initially at rest and a signal applied, the SCR circuit fires early in the half cycle applying a large amount of power to the motor to accelerate it. As the motor comes up to speed, the increasing feedback signal of residual induced motor voltage retards the firing angle thus applying less power to the motor. This feedback circuit establishes an approximate proportional relationship between motor speed and input signal regardless of load. The speed of response is very good for this type of application. Overall feedback to establish correspondence between handwheel load (film spool) position is, of course, accomplished with the potentiometer. In the experimental breadboard, no sluggish oscillation, or over control is apparent when the gain is properly set.

The breadboard investigation, although crude in some respects, has given us sufficient confidence in the feasibility of the design to proceed with its incorporation into the three light table designs. This has been completed [redacted] and all long lead fabricated and purchased parts have been released. In addition, the breadboard investigation is being pursued in parallel with the intent of setting up the actual components which will be used in the final equipment.

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Provisions are also provided for manual operation. A switch on the front of the instrument declutches the motors from the film drives, and a mechanical stop in the handwheel allows the operator to physically drive the film spools after he rotates the handwheel through a small angle. Also, there is provision for "hands-off" transport of the film by operating switches on the panel. Electrically interlocked mechanical clutches on the handwheels permits the film to be transported automatically without the handwheel turning.

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PROBLEM AREAS

A few circuit design problems still exist in the interconnection of the handwheel controls, film raising solenoids and electrical brakes to obtain foolproof operation under all conditions. This, however, is a design area which is not affecting the main task of design and fabrication.

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The work done on the design of the power assist described above [redacted] is also applicable [redacted] since it is intended to use the same system. 25X1

25X1 The [redacted] castings have been redesigned to accommodate the components for the power assist.

As a result of the customer's representative's concern over the forces required by an operator to position the X and Y carriages while using the microscope, an investigation was made into the feasibility of reducing the friction of the ways. An arrangement was arrived at, that looks promising, and consideration is being given to its incorporation in the [redacted] designs. 25X1 The technique retains the same basic bronze rod sliding in a precision vee groove philosophy, but reduces the force required to move the carriages by supporting a good portion of the carriage weight with a spring loaded ball bearing roller, rolling in the grinding clearance undercut groove in the bottom of the vee. The spring pressure on this roller is easily adjustable from a few pounds up to almost the total carriage load.

PROJECTED WORK FOR NOVEMBER

25X1 [redacted] All details will be cleaned up and released for manufacture. We expect to receive the main casting from the

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foundry, inspect it and perform some machining operations.

In regard to the power assist development, we expect to receive prototypes of all the components to be used in the final design and to have a breadboard power assist system in operation.

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Main castings will be released and patterns finished. Completion of release of all long lead items will be effected. Special micrometer heads will be received from vendor and inspected.

It is expected that a decision will be made to modify the design to include the friction reducing scheme described above. This being the case, all drawing changes will be made, and the parts released for fabrication.